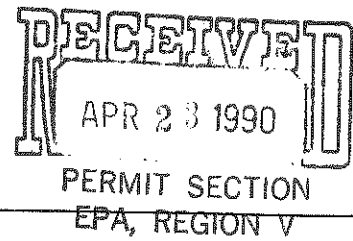




TIMET

100 TITANIUM WAY, P.O. BOX 309
TORONTO, OHIO 43964 • (614) 537-1571



July 20, 1988

Mr. George Elmaraghy, P.E.
Assistant Chief for Water Program
Division of Water Pollution Control
Ohio EPA
P.O. Box 1049
1800 Water Mark Dr.
Columbus, Ohio 43266-0149

Re: 301(c) Variance Application For
OEPA Permit OIE00010*CD

Dear Mr. Elmaraghy:

Enclosed please find our 301(c) Variance Application for OEPA Permit OIE00010*CD. We have used those forms and are submitting the attachment per your June 8, 1988 letter to Mr. Fred Steinberg.

Thank you for your assistance in providing us with this information.

Sincerely,



N. M. Lengyel

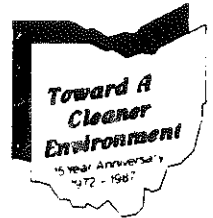
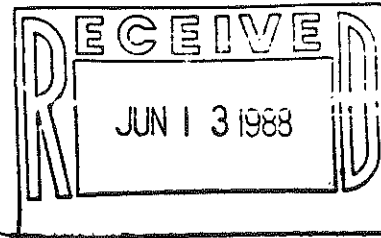
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Timet's 301(c)
Variance Request



State of Ohio Environmental Protection Agency

P.O. Box 1049, 1800 WaterMark Dr.
Columbus, Ohio 43266-0149



Richard F. Celeste
Governor

June 8, 1988

Mr. Fred Steinberg
Timet
420 Rouser Road
P.O. Box 2824
Pittsburgh, PA 15230

Dear Mr. Steinberg:

Please complete the enclosed forms and supply the necessary attachments. All of the requested information is necessary to complete a review for a 301(c) variance.

Any other information that is submitted will be analyzed with respect to the review. If you have any questions please call Monica Stanley at (614) 644-2001.

Sincerely,

George Elmaraghy, P.E.
Assistant Chief for Water Program
Division of Water Pollution Control

GE/MS/rmc
0705E/14

cc: Monica Stanley
John Morrison

INDEX

301(c) VARIANCE APPLICATION

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-Variance Application Form

-Brief Description of Existing Facility and the Problems Associated with BAT Limits

SECTION II ATTACHMENTS

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- 1.2 Brief Description of Lowest Cost Alternative to Meet BAT for Toxics, Conventionals, and Non-Conventionals
- 1.3 Brief Description of Lowest Cost Alternative to Meet BAT for Toxics and Conventionals
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SECTION III APPENDIX

1. Estimate for Pickle Rinse Water Treatment System

301(c) Variance Application

Name Titanium Metals Corporation of America
Timet Division, Toronto Plant

Address 100 Titanium Way, Toronto, Ohio 43964

Phone # (614) 537-1571

Contact Person Nicholas M. Lengyel P.E.

Title Manager - Engineering/Purchasing/Maintenance

Date July 20, 1988

NPDES # OIE00010*CD

Brief description of the existing facility and the problems associated with BAT limits:

(Attach additional sheets if necessary)

Please Refer to Description on Attached Sheet

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision and that the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are substantial penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signed

Date

FOR OEPA USE ONLY

			Recommended	Not Recommended
* Date Received	_____	Economist	_____	_____
* Date Reviewed	_____	IWW	_____	_____
* Variance Recommended	_____	Asst. Chief, DWPC	_____	_____
* Region V Recommended	_____	Chief, DWPC	_____	_____
* Headquarters Approval	_____	Chief, DWQMA	_____	_____
* Permit Issued	_____	Director	_____	_____
* Permit Expiration	_____		_____	_____

I. BRIEF DESCRIPTION OF EXISTING FACILITY AND THE PROBLEMS ASSOCIATED WITH BAT LIMITS FOR TOXICS, CONVENTIONAL AND NON-CONVENTIONAL.

Titanium Metals Corporation of America (Timet) is requesting a variance from BAT requirements for CWA section 301(b)(2)(f) pollutants pursuant to section 301(c) of CWA. The variance is requested for Outfalls 006 and 003 at the Toronto, Ohio Mill, OEPA Permit No. OIE00010*CD. The applicable effluent guidelines are those for the Non-Ferrous Metals Forming Point Source Category, Titanium Forming Subcategory.

Timet's Toronto facility, because of its age, layout and design is physically incapable of using end of pipe treatment or has sufficient space available for holding ponds to permit effective settling. The only economically feasible alternative for control of toxics and conventional pollutants involved either the complete elimination of the material from the facility or specific controls and measures to prevent the material from entering wastewater. Unfortunately for one nonconventional pollutant Fluoride, whose use is essential to the pickling of metal, it is impossible to keep out of the discharge (the majority of waste Fluoride is hauled off site as spent acid) and therefore must be treated to meet BAT limits for nonconventional pollutants. This alternative (Pickle Rinse Water Fluoride Treatment System) is discussed below.

Timet can and to a large extent has already taken the alternative to meet BAT limitations (using reduction, elimination of toxic chemicals and process controls) for toxics and conventional pollutants which represent the maximum use of technology within its economic capability. This has resulted in reasonable further progress towards the elimination of the discharge of pollutants. The cost of this alternative to date is \$78,700 with and additional \$219,000 needed to be spent. A description of the various aspects of this system is shown in Appendix A. The annual operating cost of the alternative is \$748,745. The cost of the alternative to meet BAT for non-conventional using lime neutralization and settling is \$3,573,600 dollars with an annual operating cost of \$394,900 which represents a severe economic hardship and for this one plant represents a Capital expenditure 250% higher than the EPA Development Document anticipated would need to be spent by the entire Titanium subcategory in meeting all BAT limits. Detailed costs of Timet's Environmental Expenses are given in Appendix B. Audited Financial Statements for the years 1983 through 1987 are given in Appendix C.

The only additional reduction in pollutants that the BAT alternative for toxic, conventional and non-conventional has over the alternative for toxic and conventional is a reduction in the Fluoride discharge from 192.20 Kg/day and

85.30 Kg/day on a 30 day average to 29.1 Kg/day and 12.9 Kg/day on a 30 day average at Outfall 006 and from 192.20 Kg/day and 85.3 Kg/day on a 30 day average to 19.1 Kg/day and 8.47 Kg/day on a 30 day average at Outfall 003.

The high Capital cost of the BAT alternative for toxic, conventional and non-conventional is related to the layout of the facility. Timet operates a Titanium mill in Toronto, Ohio at the site of an old steel mill built in the 1900's with all the original buildings, sewers and utilities still in use along with some of the original equipment. Process operations which generate waste water that requires treatment are spread over 42 acres. Process and non-process waste waters are intermingled throughout the facility with discharges from six outfalls located 2700 feet apart into two different receiving bodies. The sewer system is approximately 10 feet below the road surface and discharges 25 feet below the banks into receiving waters. At times during high water levels the end of pipe of an outfall can be as much as 10 feet under water.

The land at the facility site is almost completely utilized with various structures leaving insufficient space for holding pond construction and making it difficult to site new treatment facilities. In addition the facility is cut in half by a Conrail railroad rightaway. There is no usable land outside the facility boundaries for expansion.

SECTION II

ATTACHMENTS TO 301(c) VARIANCE APPLICATION

1.0 GENERAL PLAN

1.1 Brief Description at Existing Waste Water Treatment Facilities

Without the means of installing, in an economically reasonable way, end of pipe treatment control for toxic and conventional pollutants discharge has historically been minimized to the best extent possible by the elimination or drastic reduction of the use of substances or the operation of processes which result in their discharge. In these areas where it was necessary to use substances which could cause the release of toxic or conventional pollutants specific controls were adopted to prevent or reduce the entrance of pollutants into the discharge. Toxic pollutants for which BAT limitations are given; Zinc, Copper, Cyanide and Lead are not purchased or used in Titanium Forming. Plant procedures were changed in 1986 to eliminate the use of volatile organic compounds (VOC). BAT alternative for conventional pollutants involved the adoption of strict process controls, identification of storm sewers to prevent accidental spillage, training of employees and secondary containment throughout the facility.

1.2 BRIEF DESCRIPTION OF LOWEST COST ALTERNATIVE TO MEET
BAT FOR TOXICS, CONVENTIONAL AND NON-CONVENTIONAL
POLLUTANTS

The lowest cost BAT alternative for toxics, conventional and non-conventional pollutants requires the installation of a Pickle Rinse Water Fluoride Treatment System. Details of the system and drawings are given in Appendix D. Since BAT limits can be obtained for toxics, conventional and all non-conventional pollutants except Fluoride, as previously discussed, the cost of the system can be attributed solely to the control of Fluoride, the only nonconventional pollution in which BAT limitation cannot be met.

This system is the lowest cost alternative to treat pickling and fume scrubber rinse water that may meet BAT limitations for fluorides. This alternative requires rinse water to be collected from nine separate sources scattered throughout the plant and then pumped to a central facility for treatment.

<u>SOURCE</u>	<u>FLOW</u>
STRIP PICKLE LINE RINSE	20 GPM
STRIP PICKLE LINE FUME SCRUBBER	5 GPM
D-P LINE RINSE	105 GPM
D-P LINE FUME SCRUBBER	5 GPM
SHEET SCRUBBER RINSE	90 GPM
SUB-TOTAL (WEST PLANT)	225 GPM

SHEET & PLATE PICKLER RINSE	100 GPM
SHEET & PLATE KOH RINSE	100 GPM
SHEET & PLATE PICKLER FUME SCRUBBER	5 GPM
FORGE PICKLER RINSE	10 GPM
SUB-TOTAL (EAST PLANT)	215 GPM
TOTAL PLANT	440 GPM

All West Plant flows will have to be collected in a surge tank for transfer to the treatment facility located in the East Plant. Water from the West Plant can be pumped to the treatment facility utilizing, to minimize cost, an existing pipe bridge that crosses the property of Consolidated Rail which divides the Timet Plant. All plant flows will have to be collected and mixed in a 5000 gallon collection and surge tank at the treatment facility. Any tramp oil or grease will have to be removed using an oil skimmer. The fluid conditions leaving this tank should be as follows:

PH	2-3
FLUORIDE	40-50 PPM
SUSPENDED SOLIDS	300 PPM
OIL & GREASE	NONE
TEMPERATURE	AMBIENT

The fluid must next be pumped to a neutralization tank at a maximum rate of 450 GPM. Lime can be fed from a lime silo and mixed with the effluent to neutralize it. This entire process will have to be pH-controlled. The neutralized effluent then must be pumped, in equal volumes, to two plate clarifiers for removal of fluorides and solids. Polymer addition units may also have to be incorporated into these units to assist this process. The solids removed by these units must then be pumped to 1000 gallon sludge holding tanks. A third clarifier will also have to be installed as a standby unit to provide uninterrupted operation of the treatment facility during maintenance of the existing units. The material from the sludge holding tanks will need to be pumped to two 10 cubic foot filter presses where the effluent and solids are separated. The cake of solids is collected for landfill disposal. The effluent is returned to the surge tank for further processing.

The effluent from the clarifiers will then have to be pumped through polishing filters for final solids removal. Prior to discharge into a 2500 gallon clean water tank lime or acid addition will be required along with a monitoring and control system to maintain a pH range of 6 to 9. The maximum fluoride content should be less than 1.5 PPM. The maximum suspended solids should be less than 10 PPM. Sludge generated here by pH control will have to be returned to the neutralization tank for further processing. Effluent will be decanted from the top of this tank for discharge into the

Ohio River.

At a capital cost of 3.6 million dollars and an operation cost of 400,000 per year we have serious reservations that this treatment will provide a sufficient continued reduction in fluoride to meet BAT limits. We have some reservations about the ability to pump liquids any distance over various structures and rights-of-way in all weather conditions. A second major concern is the ability to settle out solids without using a holding pond or clarifier for which there is insufficient space. If solids are not settled out properly the fluoride levels of the discharge would still be high and line blockage problems will persist after neutralization. Finally we are now developing a solid waste problem for sludge where there is little space for storage or handling.

1.3 BRIEF DESCRIPTION OF LOWEST COST ALTERNATIVE TO MEET
BAT FOR TOXICS AND CONVENTIONAL

The present system described under section 1.1 meets BAT for toxics and conventionals. We propose to supplement this system as shown in 1.5 to further reduce pollutants.

1.4 CAPITAL COST OF LOWEST COST ALTERNATIVE TO MEET BAT FOR
TOXICS, CONVENTIONAL AND NON-CONVENTIONAL

Capital cost is estimated at 3.6 million dollars per
year with details given in Section III.

1.5 CAPITAL COST FOR LOWEST COST ALTERNATIVE TO MEET BAT
FOR TOXICS AND CONVENTIONALS

A) Projects Completed

Secondary Containment for Acid Storage Areas	\$ 61,000
Oil & Grease Control Program	7,200
Reconnect Lab Sewers to Sanitary Sewers	4,500
Purchase & Install Oil/Water Separators on Compressed Air Dryer Blowdowns	<u>6,000</u>
	\$ 78,700

B) Projects Planned

Projects Completed and Planned for
Toxics and Conventional

Reconnect Tube Mill Drains with "Lusol" to Toronto POTW	\$ 9,000
Convert Plant Potable Water System to Toronto City Water and discontinue Chlorination	90,000
Replace 2 PCB Transformers during 1988	<u>120,000</u>
	\$219,000

1.6 ANNUAL OPERATION AND MAINTENANCE COST FOR LOWEST COST
ALTERNATIVE TO MEET BAT FOR TOXICS CONVENTIONAL AND
NON-CONVENTIONAL POLLUTANTS

Annual operation and maintenance cost is estimated at
400,000 dollars per year with details given in Section III.

1.7 EXISTING ANNUAL OPERATION AND MAINTENANCE COST FOR
LOWEST COST ALTERNATIVE TO MEET BAT FOR TOXICS AND
CONVENTIONAL POLLUTANTS

Annual Maintenance Cost	\$111,000
Outfall Monitoring and Testing	58,000
Waste Oil Disposal	2,000
Spent Acid Disposal	272,745
Environmental Engineering Cost	<u>65,000</u>
	\$508,745

1.8 EXISTING ANNUAL OPERATION AND MAINTENANCE COST OF
POLLUTION CONTROL EQUIPMENT AND SERVICES

Annual Maintenance Cost of Environmental Compliance Equipment	\$326,000
Outfall Monitoring and Testing Cost	58,000
Waste Oil Disposal	2,000
Spent Acid Disposal Cost	272,745
Environmental Engineering Cost	<u>90,000</u>
	\$748,745

2.0 AUDITED FINANCIAL REPORTS AND ECONOMIC FACTORS
FOR 1983 through 1987.

INDEX

- 2.1 - Audited Financial Reports
- 2.2 - Employment vs Selling Price
- 2.3 - Capital Expenditures for
Environmental Control
- 2.4 - Capital Plan vs Spending
Including Environmental

2.1 AUDITED FINANCIAL REPORTS

2.2 TORONTO PLANT EMPLOYMENT VS AVERAGE PRODUCT SELLING PRICE

<u>QTR/YR</u>	<u>HOURLY</u>	<u>SALARY</u>	<u>TOTAL</u>	<u>PRICE/LB</u>
1/82	583	242	825	13.85
2/82	551	225	776	
3/82	463	216	679	
4/82	417	194	611	
1/83	334	166	500	9.83
2/83	361	174	535	
3/83	448	187	635	
4/83	393	185	578	
1/84	354	177	531	8.62
2/84	409	186	595	
3/84	469	199	668	
4/84	492	204	696	
1/85	463	207	670	9.03
2/85	462	193	655	
3/85	474	203	677	
4/85	462	185	647	
1/86	433	178	611	8.29
2/86	439	178	617	
3/86	452	180	632	
4/86	424	178	602	
1/87	413	185	598	7.68
2/87	423	184	607	
3/87	425	184	609	
4/87	392	180	572	
1/88	351	174	525	N.A.
2/88	358	175	533	

1983 THRU 1987

2.3 CAPITAL EXPENDITURES FOR ENVIRONMENTAL CONTROL

DESCRIPTION	1983	1984	1985	1986	1987
SHEET TUBE SCRUBBER	11,000	50,000			
VERMICULITE DUST COLLECTOR		13,000	2,000		
RECLAIM OIL SYSTEM		2,000			
RECYCLE OIL SYSTEM			29,000		
SPILL CONTAINMENT SYSTEMS			54,000	7,000	
REPLACE PCB TRANSFORMERS			37,000		
DUST COLLECTION MIDWEST GRINDERS			778,000	169,000	
REPLACE PCB TRANSFORMERS				54,000	
DUST COLLECTION FOX GRINDERS				34,000	68,000
ADD'L DUST COLL MIDWEST GRDS				165,000	
REPLACE PCB TRANSFORMERS					57,000
	11,000	65,000	900,000	429,000	125,000

1988 PROJECTS:

REPLACE PCB TRANSFORMERS	120,000
CITY WATER SYSTEM	90,000
OFF LINE CLEANING SYSTEM	<u>120,000</u>
	330,000

1983 THRU 1987

2.4 CAPITAL PLAN VS SPENDING INCLUDING ENVIRONMENTAL

YEAR	PLAN	SPENT	ENVIRONMENTAL	%
1983	5,929,000	907,000	11,000	1.2
1984	6,859,000	1,001,000	65,000	6.5
1985	5,438,000	1,952,000	900,000	46.1
1986	5,483,000	2,736,000	429,000	15.7
1987	2,627,000	1,266,000	125,000	9.9
1988	3,112,000	* 1,181,000	* 330,000	27.9

* ESTIMATED FOR 1988

TOTAL	9,043,000	1,860,000	20.6
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SECTION III

APPENDIX

PICKLE RINSE WATER
FLUORIDE TREATMENT SYSTEM
PRELIMINARY

TIMET
TORONTO, OHIO
20 JULY 1988

TIMET-TORONTO, OHIO
PICKLE RINSE WATER FLUORIDE TREATMENT SYSTEM-PRELIMINARY

1. EQUIPMENT LIST

.1 Mechanical Equipment

- .1 3 Inclined Plate Clarifiers with Polymer System
(Great Lakes Environmental Model IPC-4-990)
- .2 2 Ten Cubic Foot Filter Presses (200 lb/cu.ft.)
- .3 2 Multi-Media(Sand/Gravel) Polishing Filters
- .4 1 Fifty Ton Lime Silo with Loading System, Baghouse,
Feed System and Controls
- .5 1 Acid Tank with Feed System and Controls

2. Tanks

- .1 1 500 Gallon Pickle Line Surge Tank
- .2 1 1000 Gallon Transfer Tank
- .3 1 5000 Gallon Collection and Surge Tank with Agitator
and Oil Skimmer
- .4 1 2500 Gallon Neutralization Tank with Agitator and pH
Control
- .5 1 2500 Gallon Clarified Water Surge Tank
- .6 2 1000 Gallon Sludge Holding Tanks
- .7 1 2500 Gallon Clean Water Tank with Agitator and pH
Monitor and Adjustment System

3. Piping and Valves

- .1 1500 LF 2" Lined Pipe
- .2 2500 LF 3" Lined Pipe
- .3 1500 LF 4" Lined Pipe
- .4 150 LF Casing for Pipe on Pipe Bridge
- .5 Lot Unlined Pipe

.3 Piping and Valves (Continued)

- .6 12 2" Lined Valves
- .7 14 3" Lined Valves
- .8 2 4" Lined Valves
- .9 Lot Unlined Valves
- .10 Lot Pipe Supports
- .11 Lot Heat Tracing and Insulation

.4 Pumps

- .1 2 205 GPM Sheet and Plate Pickler Sump Pumps
- .2 2 10 GPM Forge Pickler Sump Pumps
- .3 2 110 GPM D-P Line Sump Pumps
- .4 2 25 GPM Pickle Line Surge Pumps
- .5 2 90 GPM Sheet Scrubber Sump Pumps
- .6 2 225 GPM Transfer Pumps
- .7 2 450 GPM Neutralization Tank Feed Pumps
- .8 4 230 GPM Clarifier Feed Pumps
- .9 4 Sludge Holding Tank Feed Pumps (Diaphragm)
- .10 4 Filter Press Feed Pumps (Diaphragm)
- .11 4 230 GPM Polishing Filter Feed Pumps
- .12 2 10 GPM Sludge Return Pumps (Diaphragm)
Clean Water Tank to Neutralization Tank

.5 Electrical and Instrumentation

- .1 Lot Electrical Installation
- .2 Lot Dry Run Protectors for all Pumps
- .3 Lot Level Control Systems for all Pumps and Tanks
- .4 Lot Flow Control Systems (including Valves)

6. Buildings and Auxiliaries

- .1 1 50' x 130' x 25' Building with 5 Ton Overhead Crane
- .2 1 200 CFM Air Compressor with Dryer
- .3 Lot Remove Underground Oil Storage Tanks
- .4 Lot Remove and Relocate Pole Building
- .5 1 New Sewer and Outfall with Flow Recorder and Sampling Equipment

.7 Operating Spares

- .1 Lot Operating Spares

.8 Engineering

- .1 Lot Specifications
- .2 Lot Drawings
- .3 Lot Engineering Management
- .4 Lot Permits and Fees

.9 Construction Management

- .1 Lot Construction Manager
- .2 Lot Construction Foreman
- .3 Lot Construction Assistant/Clerk

TIMET - TORONTO, OHIO
PICKLE RINSE WATER FLUORIDE TREATMENT SYSTEM-PRELIMINARY

2. PROJECT ESTIMATE

<u>.1</u>	<u>Mechanical Equipment</u>	<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	3 Inclined Plate Clarifiers Polymer System (Great Lakes Environmental Model IPC-4-990)	126,000	100,000	226,000
.2	2 Ten Cubic Foot Filter Presses (200 lb/cu.ft.)	54,000	25,000	79,000
.3	2 Multi-Media (Sand/Gravel) Polishing Filters	50,000	25,000	75,000
.4	1 Fifty Ton Lime Silo with Loading System, Baghouse, Feed System and Controls	75,000	50,000	125,000
.5	1 Acid Tank with Feed System and Controls	<u>5,000</u>	<u>3,000</u>	<u>8,000</u>
.70	Sub-Total Mechanical Equipment	\$310,000	\$203,000	\$513,000

.2 <u>Tanks</u>			<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	1	500 Gallon Pickle Line Surge Tank	10,000	1,500	11,500
.2	1	1000 Gallon Transfer Tank	15,000	2,500	17,500
.3	1	5000 Gallon Collection and Surge Tank with Agitator and Oil Skimmer	25,500	6,000	31,500
.4	1	2500 Gallon Neutralization Tank with Agitator and pH Control	24,500	5,500	30,000
.5	1	2500 Gallon Clarified Water Surge Tank	20,000	3,500	23,500
.6	2	1000 Gallon Sludge Holding Tanks	30,000	7,500	37,500
.7	1	2500 Gallon Clean Water Tank with Agitator and pH Monitor and Adjustment System	<u>29,500</u>	<u>8,500</u>	<u>38,000</u>
.70 Sub-Total Tanks			\$154,500	\$35,000	\$189,500

.3	<u>Piping and Valves</u>		<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	1500 LF	2" Lined Pipe	30,000	15,000	45,000
.2	2500 LF	3" Lined Pipe	62,500	37,500	100,000
.3	1500 LF	4" Lined Pipe	52,500	37,500	90,000
.4	150 LF	Casing for Pipe on Pipe Bridge	7,000	1,500	8,500
.5	Lot	Unlined Pipe	50,000	25,000	75,000
.6	12	2" Lined Valves	4,200	600	4,800
.7	14	3" Lined Valves	6,300	900	7,200
.8	2	4" Lined Valves	1,200	200	1,400
.9	Lot	Unlined Valves	5,000	3,000	8,000
.10	Lot	Pipe Supports	15,000	15,000	30,000
.11	Lot	Heat Tracing and Insulation	<u>102,500</u>	<u>88,800</u>	<u>191,300</u>
.70		Sub-Total Piping and Valves	\$336,200	\$225,000	\$561,200

.4	<u>Pumps</u>	<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	2 205 GPM Sheet and Plate Pickler Sump Pumps	10,000	3,000	13,000
.2	2 10 GPM Forge Pickler Sump Pumps	6,000	2,000	8,000
.3	2 110 GPM D-P Line Sump Pumps	6,000	3,000	9,000
.4	2 25 GPM Pickle Line Surge Pumps	6,000	2,000	8,000
.5	2 90 GPM Sheet Scrubber Sump Pumps	9,000	3,000	12,000
.6	2 225 GPM Transfer Pumps	13,000	3,000	16,000
.7	2 450 GPM Neutralization Tank Feed Pumps	13,000	4,000	17,000
.8	4 230 GPM Clarifier Feed Pumps	24,000	8,000	32,000
.9	4 Sludge Holding Tank Feed Pumps (Diaphragm)	10,000	4,000	14,000
.10	4 Filter Press Feed Pumps (Diaphragm)	10,000	4,000	14,000
.11	4 230 GPM Polishing Filter Feed Pumps	24,000	8,000	32,000
.12	2 10 GPM Sludge Return Pumps (Diaphragm) - Clean Water Tank to Neutralization Tank	<u>5,000</u>	<u>3,000</u>	<u>8,000</u>
.70	Sub-Total Pumps	\$136,000	\$47,000	\$183,000

<u>.5 Electrical and Instrumentation</u>		<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	Lot Electrical Installation	75,000	40,000	115,000
.2	Lot Dry Run Protectors for all Pumps	7,200	4,500	11,700
.3	Lot Level Control Systems for all Pumps and Tanks	4,000	4,000	8,000
.4	Lot Flow Control Systems (including Valves)	<u>11,100</u>	<u>7,500</u>	<u>18,600</u>
.70	Sub-Total Electrical and Instrumentation	\$97,300	\$56,000	\$153,300
<u>.6 Buildings and Auxiliaries</u>		<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	1 50' x 130' x 25' Building with 5 Ton Overhead Crane	345,000	335,000	680,000
.2	1 200 CFM Air Compressor with Dryer	25,000	15,000	40,000
.3	Lot Remove Underground Oil Storage Tanks	-	40,000	40,000
.4	Lot Remove and Relocate Pole Building	-	15,000	15,000
.5	1 New Sewer and Outfall with Flow Recorder and Sampling Equipment	<u>8,000</u>	<u>10,000</u>	<u>18,000</u>
.70	Sub-Total Buildings and Auxiliaries	378,000	415,000	793,000
<u>.7 Operating Spares</u>		<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	Lot Operating Spares	<u>200,000</u>	-	<u>200,000</u>
.70	Sub-Total Operating Spares	200,000	-	200,000

.8 <u>Engineering</u>		<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	Lot Specifications	54,400	-	54,400
.2	Lot Drawings	123,300	-	123,300
.3	Lot Engineering Management	62,300	-	62,300
.4	Lot Permits and Fees	<u>5,000</u>	-	<u>5,000</u>
.70	Sub-Total Engineering	\$245,000	-	\$245,000
.9 <u>Construction Management</u>		<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	Lot Construction Manager	-	62,700	62,700
.2	Lot Construction Foreman	-	35,200	35,200
.3	Lot Construction Assistant/Clerk	-	<u>42,100</u>	<u>42,100</u>
.70	Sub-Total Construction Management		\$140,000	\$140,000

.10	<u>Summary</u>	<u>Material</u>	<u>Installation</u>	<u>Total</u>
.1	Mechanical Equipment	310,000	203,000	513,000
.2	Tanks	154,500	35,000	189,500
.3	Piping and Valves	336,200	225,000	561,200
.4	Pumps	136,000	47,000	183,000
.5	Electrical and Instrumentation	97,300	56,000	153,300
.6	Buildings and Auxiliaries	378,000	415,000	793,000
.7	Operating Spares	200,000	-	200,000
.8	Engineering	245,000	-	245,000
.9	Construction Management	-	<u>140,000</u>	<u>140,000</u>
.70	Sub-Total	1,857,000	1,121,000	2,978,000
.80	20% Contingency	<u>371,400</u>	<u>224,200</u>	<u>595,600</u>
.90	Total Project	2,228,400	1,345,200	3,573,600

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TIMET - TORONTO, OHIO

PICKLE RINSE WATER FLUORIDE TREATMENT SYSTEM - PRELIMINARY

3. ESTIMATED ANNUAL OPERATING AND MAINTENANCE COSTS

.1	Neutralizing Agents (Lime and Acid)	150,000
.2	Operators	160,000
.3	Maintenance	
.1	Material	19,000
.2	Labor	42,900
.4	Power	3,000
.5	Heat	<u>20,000</u>
.90	Total Estimated Annual Operating and Maintenance Costs	\$394,900